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ABSTRACT

The effect of computer assisted instruction (CAI) in Kansas City, Missouri Schools on selected achievement measures and perceptions about the CAI experience collected from students, teachers, and CAI lab aides was examined. At the secondary school level, the evaluation examined the effects of CAI mathematics and social studies lessons on eighth and ninth grade students. CAI reading and mathematics lessons were used at the elementary school level. The report separates evaluation results into high school, junior high school, and elementary school levels. Teachers, students, and lab aides displayed positive attitudes toward CAI. The CAI labs had a positive effect on achievement as measured by the Iowa Tests of Basic Skills and the Tests of Academic Proficiency. Computer response time caused the greatest amount of frustration for students participating in CAI lessons. Appendices include opinions of students and teachers concerning CAI labs, and analysis of variance and analysis of covariance summaries. (DWH)

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EVALUATION OF COMPUTER-ASSISTED INSTRUCTION

EVALUATION OFFICE

SCHOOL DISTRICT OF

KANSAS CITY, MISSOURI

AUGUST, 1984

TM 160 242

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EVALUATION OF COMPUTER ASSISTED INSTRUCTION

JOYCE W. WAY

PROGRAM EVALUATOR

AUGUST, 1984

THE SCHOOL DISTRICT OF KANSAS CITY, MISSOURI

DEPARTMENT OF PLANNING, RESEARCH, EVALUATION AND TESTING

EVALUATION OFFICE

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EVALUATION OF

COMPUTER ASSISTED INSTRUCTION

1983-84

INTRODUCTION

Computer assisted instruction (CAI) is a process by which students learn with the direct aid of a computer. Instructional materials are stored in a computer and students interact with these materials at a computer terminal. This evaluation is limited to the computer assisted instruction lessons which have been developed by school district personnel and are stored in the school district's main frame computer at the Board of Education Building. Students interact with this computer from terminals located at their school buildings. CAI lessons have been developed in the subject areas of reading, mathematics and social studies. The CAI social studies lessons cover three instructional topics: reading maps, reading and interpreting graphs, and using reference information.

The goal of this evaluation was to examine CAI at the elementary, junior high, and senior high school levels. Since each of these education levels required some special evaluation considerations, this report is divided into three major sections by colors. The first section, on yellow paper, contains the evaluation design and results for the junior high school level. The second section, on green paper, contains the evaluation design and results for the senior high school level. The final section, on pink paper, contains the evaluation design and results for the elementary school level. An executive summary of the evaluation results at all three levels is presented on the white pages that immediately follow this introduction.

EXECUTIVE SUMMARY

This evaluation examined CAI's effect on selected achievement measures and perceptions about the CAI experience collected from students, teachers and CAI lab aides. At the secondary school level, the evaluation examined the effect of CAI mathematics and social studies lessons on eighth grade students at junior high schools and ninth grade students at Paseo Senior High School.

Analysis of the achievement data at the junior high school level showed that the eighth grade students attending CAI labs had significantly higher scores than the comparison eighth grade students on all of the Iowa Tests of Basic Skills (ITBS) achievement measures examined. These ITBS achievement measures included the Visual Materials Test (a measure of students' skills in using information from maps, graphs, and tables), the Mathematics Computation Test, the Mathematics Concepts Test, the Mathematics Problem Solving Test, and the Mathematics Composite Score.

Analysis of the achievement data at Paseo Senior High School showed that ninth grade students attending the CAI lab had significantly higher scores than the comparison ninth grade students on the Mathematics Test from the Tests of Academic Proficiency (TAP). Differences between the two groups on TAP's Using Sources of Information Test were due to random testing errors and were not attributed to effects of the program. It should be pointed out that not all of the Paseo ninth grade students attending the CAI lab worked on CAI social studies lessons which may have affected the results on TAP's Using Sources of Information Test.

The perception data revealed that both the eighth grade students and the ninth grade students attending the CAI labs liked to work on the CAI lessons and thought the lessons improved their skills in mathematics and social studies.

More students were positive about the CAI mathematics lessons than were positive about the CAI social studies lessons. Students at both the junior high schools and at Paseo Senior High School thought the computer took too long to respond when they had given it an answer.

Teachers who sent students to the CAI lab were very positive about the lessons. All but one teacher at the junior high schools and one teacher at Paseo Senior High School thought the lessons should be continued in their subject areas, and the two remaining teachers were undecided about the continuation of CAI lessons at their schools.

The CAI lab aides were very positive about CAI lab experience but expressed some concerns about it. The junior high school lab aides thought special education students enjoyed using the CAI lab, but they needed considerable assistance. The CAI lab aide and the special education teacher could not always provide for the individual needs of all of the students in a special education class. Northeast solved the problem by having three top mathematics students serve as lab assistants when special education students were in the CAI lab.

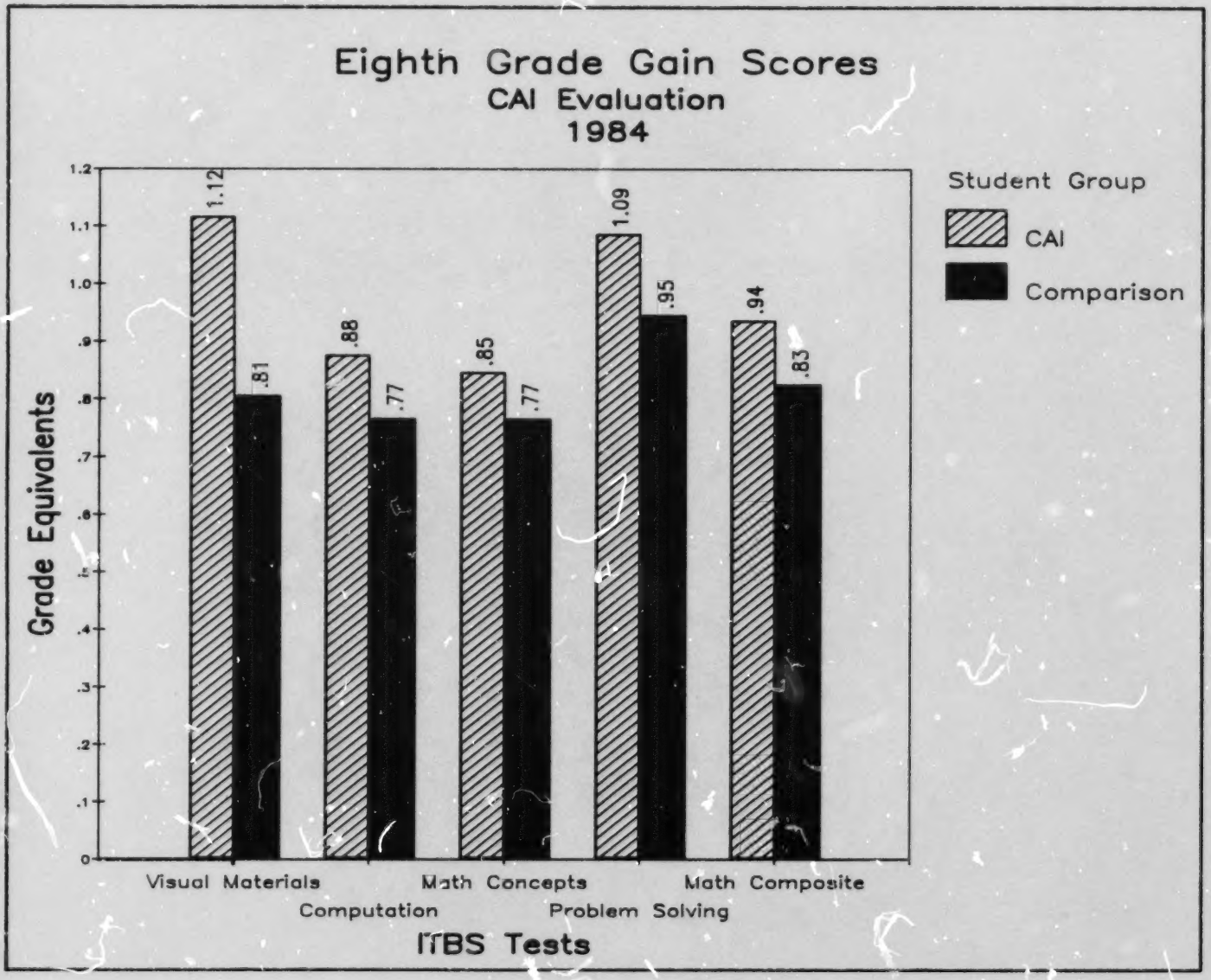
Separate carrels for each terminal were seen as an aid to the lab experience because it helped students concentrate on their own lessons with fewer distractions from their neighbors. The junior high school CAI lab aides could use more CAI lessons for advanced students and all CAI aides would like to see more coordination between students' classroom work and their lessons in the CAI lab.

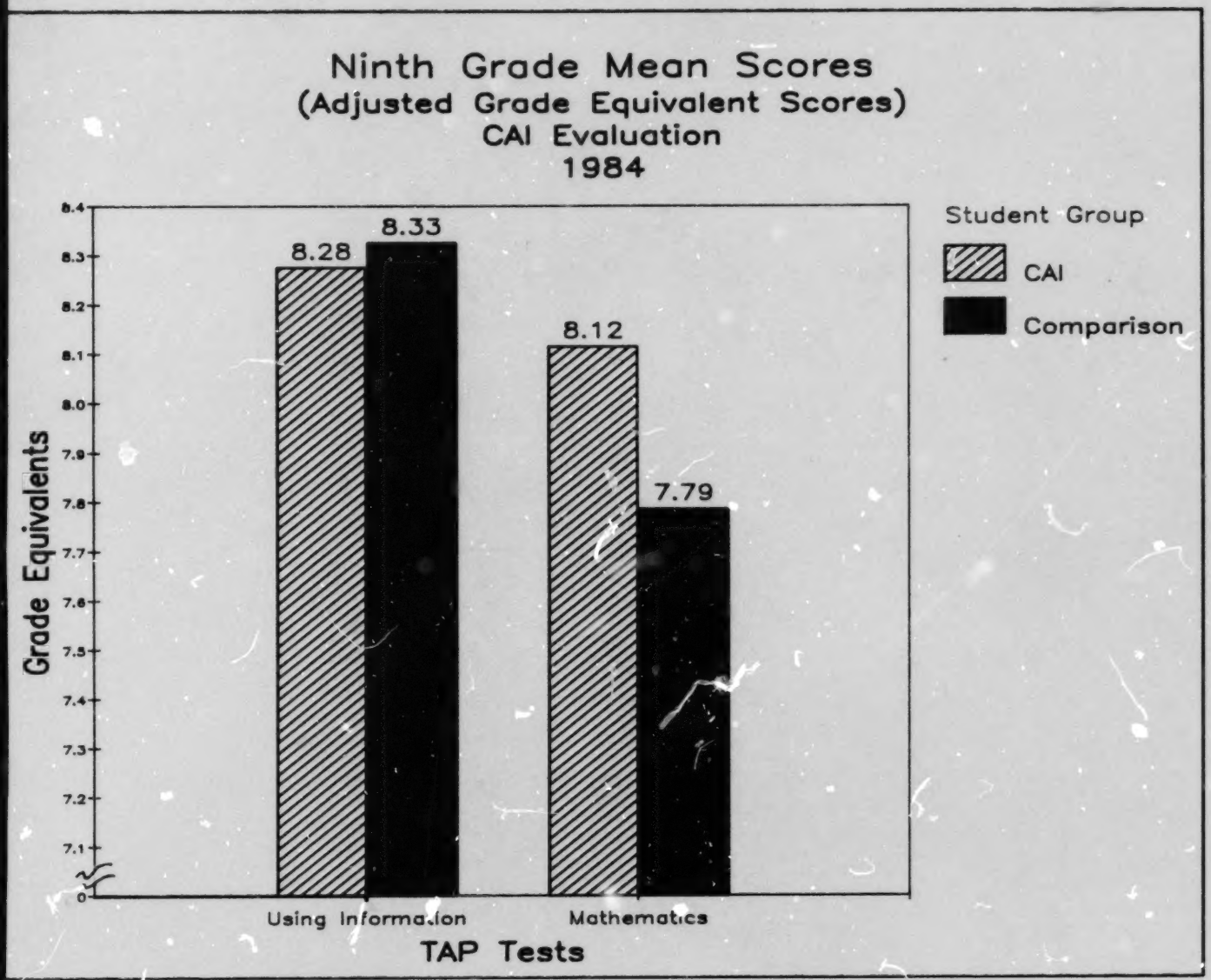
At the elementary level, CAI lessons were used in four schools this past year. Evaluation problems which could not be completely overcome at these schools made the CAI evaluation results at the elementary schools inconclusive.

In conclusion, the CAI labs in the junior high schools had a positive effect on mathematics achievement and achievement related to using sources of information. The CAI lab at Paseo Senior High School had a positive effect on

mathematics achievement. Its effect on the Using Sources of Information Test is inconclusive at Paseo Senior High School. Students and teachers at the junior high schools and at Paseo Senior High School thought the CAI lessons helped students improve their skills in mathematics and social studies. Students' biggest frustration with the CAI lessons was computer response time. The CAI lab aides had some concerns about the operation of the CAI labs which persons responsible for the CAI labs might want to consider in future planning.

Eighth grade gain scores on each of the ITBS tests used for this evaluation are presented in the graph located on the following page. Ninth grade gain scores were not available this year on the TAP test results.


Eighth Grade Gain Scores
CAI Evaluation
1984
Grade Equivalents
1.2
1.1
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
1.12
.81
.88
.77
.85
.77
1.09
.95
.94
.83
Visual Materials
Computation
Math Concepts
Problem Solving
Math Composite
ITBS Tests
Student Group
CAI
Comparison


Ninth Grade Mean Scores
(Adjusted Grade Equivalent Scores)
CAI Evaluation
1984
Grade Equivalents
8.4
8.3
8.2
8.1
8.0
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
0
8.28
8.33
8.12
7.79
Using Information
Mathematics
TAP Tests
Student Group
CAI
Comparison

EVALUATION OF CAI AT JUNIOR HIGH SCHOOLS

EVALUATION OF CAI AT JUNIOR HIGH SCHOOLS

Program Description

Four junior high schools had CAI labs this past year: Bingham, Central, Lincoln Academy, and Northeast. Bingham was the first school to use CAI. CAI lessons were started at Bingham in 1968 with funds provided by Title III money. The first years were a developmental time and it was not until 1972 that there were enough lessons and equipment to make the lessons meaningful to a large number of students at the school. Central started using CAI in 1973 and has used it continuously since that time. Both Lincoln Academy and Northeast began using CAI in 1979. Lincoln Academy has used CAI continuously since that time, but Northeast dropped the program during the 1980-81 school year when special funding ran out. They began using CAI lessons again during the 1981-82 school year.

Although CAI usage varied slightly among these four junior high schools, all schools had their eighth grade students attend the CAI lab on a regular schedule for mathematics and social studies lessons. Seventh and eighth grade special education students used the CAI lab at most of the schools for reading, mathematics or social studies lessons, depending upon these students' special learning needs.

Evaluation Procedures

The junior high school evaluation examined CAI's effect on selected Iowa Tests of Basic Skills (ITBS) achievement measures and perceptions about the CAI lab experience collected from students, teachers and CAI lab aides. Mathematics achievement was examined using the three ITBS mathematics subtests and the composite mathematics score which is a composite of these three mathematics

subtests. The three mathematics subtests measure skills in mathematics computation, mathematics concepts, and mathematics problem solving. One subtest of the ITBS Work-Study Skills Test entitled Visual Materials was used to examine achievement related to the CAI social studies lessons. This subtest measured students' skills in using information from maps, graphs and tables.

The achievement data were analyzed two ways. For the first analysis, students' spring (posttest) scores on the Visual Materials subtest, the three mathematics subtests, and the mathematics composite score were analyzed by comparing the scores of eighth grade students attending the CAI labs with comparison eighth grade students at three junior high schools that did not have CAI labs using analysis of covariance. Analysis of covariance is a procedure for analyzing data in which students' posttest scores are statistically adjusted to make two groups as similar as possible using pretest scores before the posttest scores are analyzed for differences between the two groups. For this evaluation, students' 1982-83 (pretest) scores on the appropriate ITBS tests were used to make this adjustment. These pretest scores would indicate students' achievement levels before their CAI lab experiences began.

The second analysis examined students' gain scores on these same tests. Students' scores on the pretests were subtracted from their corresponding posttest scores to get gain scores for each student on the various tests. These gain scores were analyzed using analysis of variance to examine differences between those eighth grade students attending CAI labs and comparison eighth grade students.

Perception data were collected from a sample of students attending the CAI labs at each junior high school, from teachers who sent students from their classrooms to the CAI lab, and from the CAI lab aides at each junior high school. Questionnaires were administered to the selected students and teachers,

and perception data from the CAI lab aides were collected from interviews with each of them.

Of the three CAI evaluations included in this report, the junior high school CAI evaluation contains the most valid results. CAI has been used for the longest period of time at the junior high school level. Because CAI was an established program for these junior high schools, program effects which might be caused by the novelty of a new program or by the problems associated with the implementation of a new program were largely controlled in the junior high setting. With one exception, other programs which might affect the CAI evaluation results were easily controlled at the junior high level using comparison schools. The gifted/talented program was only at Lincoln Academy and not at the comparison schools. Analysis of covariance was used to control for achievement differences between the students attending CAI labs and comparison students. This statistical procedure would help control for differences caused by the presence of gifted/talented students in only the CAI group. In addition, the achievement data were analyzed a second time with Lincoln Academy students removed from the analysis to isolate any effects that might be caused by this special program.

Results

The evaluation results are presented in two sections. The first section contains results related to achievement, and the second section contains perception results from students, teachers and CAI lab aides.

Effect on Achievement

Statistically significant differences between eighth grade students attending CAI labs and comparison eighth grade students were determined by using a .05 significance level which gives a 95 percent probability that any differences between the two groups were real rather than chance differences.

Table 1 presents summary data on ITBS achievement scores for eighth grade students attending CAI labs and for eighth grade comparison students. The table contains two types of mean scores. The first mean score for each test is unadjusted and represents each group's grade equivalent mean score determined from their actual spring (posttest) scores on each test. The adjusted mean score for each test represents a scientific estimate as to how the two groups of students would have performed on the posttest assuming that they had identical pretest means. Analysis of covariance summaries using these adjusted scores can be found in Appendix C on page 32.

It can be seen from Table 1 that eighth grade students attending CAI labs had significantly higher scores on all of the achievement measures examined. When these data were analyzed a second time with the Lincoln Academy students removed, the results were the same for all of the tests except the Mathematics Problem Solving Test. For this test, the CAI students at the remaining junior high schools still scored higher than the comparison students, but the difference was not significant at the .05 significance level (probability was .08).

Table 2 contains summary data on gain scores for eighth grade students attending CAI labs and eighth grade comparison students. Analysis of variance summaries using these gain scores can be found in Appendix C on page 32. Table 2 shows that those eighth grade students attending CAI labs had significantly greater achievement gains than the eighth grade comparison students on all tests except the Mathematics Concepts Test. When these data were analyzed a second time with the Lincoln Academy students removed, the eighth grade students attending CAI labs scored significantly higher on all tests but the Mathematics Problem Solving Test. For this test, the CAI students at the remaining junior high schools still had higher gain scores than the comparison students, but the difference was not significant at the .05 significance level

TABLE 1

Summary Data on ITBS Grade Equivalent Scores for Eighth Grade Students Attending CAI Labs and for Eighth Grade Comparison Students

ITBS Test Type of Mean	CAI Students	Comparison Students	National Norm for Spring Testing
Visual Materials[1]			
Unadjusted Mean Score	8.27	7.59	8.53
Adjusted Mean Score[2]	8.15 *	7.73	
Mathematics Computation			
Unadjusted Mean Score	8.28	8.00	8.45
Adjusted Mean Score[2]	8.22 *	8.08	
Mathematics Concepts			
Unadjusted Mean Score	8.49	7.88	8.80
Adjusted Mean Score[2]	8.30 *	8.13	
Mathematics Problem Solving			
Unadjusted Mean Score	8.30	7.84	8.58
Adjusted Mean Score[2]	8.18 *	7.99	
Mathematics Composite Score[3]			
Unadjusted Mean Score	8.35	7.89	8.60
Adjusted Mean Score[2]	8.20 *	8.07	

* 95% probability that differences between CAI Students and Comparison Students were real rather than chance differences.

1 The ITBS Visual Materials Test measures students' abilities to get and use information from maps, graphs and tables.

2 The adjusted posttest means represent a scientific estimate as to how the two groups of students would have performed on the posttest assuming that they had identical pretest means. The results from the Analysis of Covariance using these adjusted scores can be found in Appendix C.

3 The Mathematics Composite Score is not a test in itself but a score comprised of an average of the above three mathematics tests.

TABLE 2

Summary Data on ITBS Gain Scores for Eighth Grade Students Attending CAI Labs and for Eighth Grade Comparison Students

ITBS Test	CAI Students	Comparison Students
Visual Materials[1]	1.12 *	0.81
Mathematics Computation	0.88 *	0.77
Mathematics Concepts	0.85	0.77
Mathematics Problem Solving	1.09 *	0.95
Mathematics Composite Score[2]	0.94 *	0.83

* 95% probability that differences between CAI Students and Comparison Students were real rather than chance differences.

1 The ITBS Visual Materials Test measures students' abilities to get and use information from maps, graphs and tables.

2 The Math Composite Score is not a test in itself but a score comprised of an average of the above three mathematics tests.

(probability was .09). It should be noted that mean gains for the CAI students increased slightly on all of the tests when Lincoln Academy was removed from the data. It is more difficult for students who score high on tests, e.g., gifted/talented students, to make large gains. This phenomenon probably explains the inconsistent results between the first analysis and the second analysis on the Mathematics Concepts Test.

Perceptions of CAI Lab Experience

Student Perceptions. A sample of students attending CAI labs at the four junior high schools were surveyed for their perceptions of the CAI lab experience. These students' perceptions are presented in Table 3. At the bottom of the student questionnaire, students were invited to write one sentence describing their feelings about working with the computer on mathematics and social studies lessons. These comments can be found in Appendix A on page 20. Table 3 shows that 88 percent of the surveyed students liked to work on CAI mathematics lessons and 68 percent of the students liked to work on CAI social studies lessons. Also, 88 percent of the students thought that the CAI mathematics lessons helped improve their mathematics skills, and 76 percent of them thought that the CAI social studies lessons helped improve their social studies skills. Sixty-nine percent of the students indicated that the CAI mathematics lessons were interesting, and 53 percent of them indicated that the CAI social studies lessons were interesting. Students were comfortable with the difficulty of the CAI lessons. Only 18 percent of these students indicated that the CAI mathematics lessons were too easy, and 10 percent of them thought the CAI mathematics lessons were too hard. Only 19 percent of these students thought the CAI social studies lessons were too easy, and 11 percent of them indicated that the CAI social studies lessons were too hard. Seventy-seven percent of the

TABLE 3

Student Perceptions of CAI Lab Experience
at Junior High Schools [1]

Items	Agree	Undecided	Disagree
I like to work on CAI math lessons.	88%	4%	8%
I like to work on CAI social studies lessons.	68%	11%	21%
CAI math lessons help improve my math skills.	88%	6%	6%
CAI social studies lessons help improve my social studies skills.	76%	12%	13%
CAI math lessons are interesting.	69%	10%	21%
CAI social studies lessons are interesting.	53%	18%	29%
CAI math lessons are too easy.	18%	19%	64%
CAI social studies lessons are too easy.	19%	21%	61%
CAI math lessons are too hard.	10%	11%	80%
CAI social studies lessons are too hard.	11%	18%	71%
I think the computer takes too long to respond when I have given it an answer to a question.	77%	8%	15%

[1] The number of students responding to this questionnaire was 168.

students thought the computer took too long to respond when students had given it an answer to a question.

Teacher Perceptions. Table 4 presents the perceptions of the CAI lessons by teachers who sent their students to the CAI lab. Any comments teachers included on their questionnaires can be found in Appendix B on page 30. These teachers were very positive about the CAI lessons with 90 percent of them indicating that CAI was a helpful supplement to the teaching of their subject area, and 93 percent of them believed that CAI lessons helped improve their students' skills in the subject area the teacher taught. Forty-one percent of these teachers thought students had enough scheduled CAI time, and 72 percent of them would like for their students to have more time to work on their subject area in the CAI lab. Twenty-nine percent of the teachers indicated that the CAI lessons needed to be better coordinated with the work students did in their classrooms; however, 46 percent of the teachers disagreed with this statement. All but one teacher thought CAI lessons should be continued in their subject area and this one remaining teacher was undecided about the issue.

CAI Lab Aide Perceptions. The evaluator visited each CAI lab to collect information about CAI usage at each site. In addition, CAI aides were interviewed on their perceptions of the CAI lab experience. The CAI lab aides were very positive about the CAI lab experience for students, expressed some concerns about it, and made some suggestions on ways to improve the CAI experience.

All CAI aides indicated some concern about the CAI experience with special education students. These students had considerable difficulty in working by themselves and needed much one-to-one attention. They needed help reading the information on the screen and spelling the results for the computer. CAI aides often felt frustrated if they could not provide the necessary one-to-one help. The special education teacher was always available for assistance, but even two

TABLE 4

Teacher Perceptions of Computer Assisted Instruction Lessons at Junior High Schools [1]

Items	Agree	Undecided	Disagree
Computer assisted instruction is a helpful supplement to the teaching of my subject area.	90%	10%	----
I believe that computer assisted instruction lessons in my subject area help improve my students' skills in this subject area.	93%	7%	----
My students have enough scheduled computer assisted instruction time.	41%	21%	38%
The computer assisted instruction lessons need to be better coordinated with the work students are doing in my classroom.	29%	25%	46%
Computer assisted instruction should be continued in my subject area.	97%	3%	----
I would like my students to have more time to work in the computer assisted instruction lab on my subject area.	72%	17%	10%

[1] The number of teachers responding to this questionnaire was 29.

people were often not enough for these special classes. Northeast had a good solution for the problem. Three top mathematics students were made assistants for the CAI lab during special education usage, thereby providing most special education students with one-to-one help.

It was felt that separate carrels for each terminal seemed to enhance the CAI lab experience. Bingham, which had separate carrels, indicated that the privacy of the carrels helped students concentrate on their lessons better. Because other students could not see what they were doing at the terminal, they were not embarrassed by mistakes they made or whether their progress was slower than their neighbor's progress. Several CAI labs at schools that did not have individual carrels indicated that students did keep an eye on each other's terminals and were sometimes distracted by what their neighbor was doing.

The CAI lab aides were interviewed in the spring and some of them were concerned that they would have a shortage of CAI lessons for their advanced students before the school year ended.

In order to complete CAI lessons, students must know how to read computer generated material on their terminal screens and frequently respond by correctly spelling a response. Students are not only encouraged to learn the mathematics and social studies content, but they also get reading practice and spelling practice. CAI lab aides saw this as both an advantage and a disadvantage. It did integrate reading and spelling with the mathematics and social studies instructional material. However, students with extreme reading or spelling problems had difficulty completing CAI lessons even though they had learned its instructional content. It was suggested that students with these problems should probably work on CAI reading lessons rather than mathematics and social studies lessons.

Some CAI lab aides would like to see more coordination of the CAI lessons with what is taught in students' mathematics and social studies classes. Students don't always see the connection between the CAI lessons and what they are learning in their classes.

APPENDIX A

COMMENTS FROM STUDENTS ATTENDING THE JUNIOR HIGH SCHOOL CAI LABS

COMMENTS FROM STUDENTS ATTENDING THE
JUNIOR HIGH SCHOOL CAI LABS

Each student was invited to write one sentence that described how he/she felt about working on mathematics and social studies lessons in the CAI Lab. The following comments are the sentences students wrote:

- I think it's fun working with the computer lessons.
- I enjoy going to computer lab because it helps my skills and it's lots of fun!
- I don't have computer assisted social studies lessons. You should be tested in math and placed where your level is.
- I think it helps us in a way by teaching us map skills and basic math.
- The CAI math could be a lot better but the social studies part is pretty good.
- The problems on math are too easy.
- I think it helps me improve on my skills and I like working on the computers.
- I like it because it gives me a chance to work outside the classroom on the subject and I think it gives teachers a chance to do things they wouldn't be able to do otherwise.
- I feel that they help me very much.
- The computer math lessons help me to sharpen up on my basic skills.
- The math's okay, but I'd rather skip social studies.
- I think they are educational and fun.
- I like to work with the computers.
- I like working on the computer especially because it doesn't go too fast for me.
- Computers are fun, but when they waste your time it makes you angry and I want to stop. They should respond faster.
- I enjoy working on the math and social studies more on the computer than with a teacher.
- I like to work on the computer because in a way I let go of all of my angry emotions and during that time I only think about one thing: my problem on the computer.

Comments from Students Attending the
Junior High School CAI Labs--Continued

- I feel that working with the computer in math is fun, but I don't have it for social studies so I wouldn't know about that.

- I like working in computer. It really helped me on the BEST.

- We should be allowed to play games or have some fun on the computers sometimes.

- I like working on the math lessons and social studies lessons on the computers.

- I feel good but sometimes it gets too hard, but most of the time it's all right.

- Computer classes are fun, yet at the same time I am learning; I think that's very sneaky, I love it; it helps all those who won't learn to learn.

- I like working on the computers a lot and it is fun with social studies and math.

- It helps me to learn what I didn't or don't know.

- I think computer assisted instruction lessons are very nice to have, and they are interesting, and they are not boring like some people say.

- I think that computers are needed because in the future we may need these skills for a job.

- Math on computers is way too boring.

- I think the computers are fun because they help your skills and you get out of class.

- I really like the computer because it helps you learn, but it's fun.

- I love the math part, but the social studies is okay I guess.

- I like working on math lessons because they help me improve my skills.

- I like working with my computer skills. They help me improve my grades better and get good grades in my classes, E's, S's, M's.

- I think working with computers are a lot of fun and the computer improves my problems in math and social studies.

- I like it for both social studies and math.

- I feel that sometimes they are too hard and they get confusing and certain ones aren't so difficult really.

- I like working on computer math and social studies because it's fun to me.

- It's OK but it's just boring and I don't like it.

Comments from Students Attending the
Junior High School CAI Labs--Continued

- I feel that working with the computer is very very fun and educational and I like it very much.
- I think working on the computer is OK but I have a computer at home and it's fun, but I think there isn't enough to do on the school's computer.
- I like it because I can learn where the keys are on a computer while working on them.
- I like working on math lessons not social studies lessons. The math lessons are fun and interesting to do.
- I like the computer lessons but I never have enough time at the computers.
- I think that working on computers gives us a chance to expand and learn more.
- I like working on the computer because it's different and not all the paper work.
- Computers are a fun way to learn, I think kids would rather learn from computers than teachers.
- I think working with the computers are fun and knowledgeable.
- I think math is a little hard but the social studies is interesting, fun and helps me a lot.
- I think it is fun to work on computers so I enjoy working.
- It's a fun experience working with computers but I wish we could do something harder, like programming.
- I like the math lessons because it kind of seems like a contest with my friends.
- I like working on the computer.
- I feel that they help improve my ability to learn math and social studies skills.
- I think that the computer helps me improve my skills.
- It is fun working on computers and I hope I can do it in the future.
- I think it's more fun working on computers instead of on paper.
- I think the math is too hard but the social studies is fun.
- I think the social studies computer room helps me a lot on grids, maps, and graphs.

Comments from Students Attending the
Junior High School CAI Labs--Continued

- I feel that I have liked it a lot and enjoyed it most of the time.

- I like the computers because they can improve my work and I have a computer at home and it helps me with my school work.

- I hate to work on the math, but I have never did it with social studies. It is very very very boring.

- I hate it - I really do hate it. It is so boring I always fall asleep. The computer sticks, it also takes too long to respond.

- I like working with the computers.

- I think it is very good and they should have it in more schools.

- I feel it is very very very boring in all the subjects and I like computers. I even have a computer and it's very very boring in that class. Every time I go it's very boring and I always get sleepy and that's why everybody gets low grades 'cause it's so boring and fall asleep.

- The computer classes are fun most of the time.

- I like the social studies lessons but the math lessons are too hard.

- I like working with the computer because it helps my skills.

- I like to work with computer. I learn more about numbers. And social studies is fun work with a computer.

- I feel you should spend at least two and a half hours in MRS and CAI.

- Math is all right, I like social studies better.

- I like it but I don't have enough time.

- Working with the computer on math and social studies, it gives me information that I sometimes don't know.

- I like the computer because it's fun and it helps me learn more about math and social studies.

- I like working on the computer when I go to the lab. When social studies comes around, I do not want to do it.

- I think the math is too hard. It might just be because I don't like math and I'm not too interested in math. Social studies is okay.

- It just helps me with my math and social studies in the classroom as well.

- I like working with the computer because it helps my math and social studies skills.

Comments from Students Attending the
Junior High School CAI Labs--Continued

- I feel that the computer lessons help improve my grades, but we don't have enough computers and we don't stay long enough.

- I feel that math and social studies lessons help improve your thoughts and improve your skills of work.

- I like computers in math and social studies.

- I enjoy working on the computers on math and social studies because it helps me a lot.

- I like working with computers and I would like to learn more about them.

- I like work with computers in math and social studies. Also computers give us a head start to work with them in the future.

- I like both lessons and I love the computer. I just want to get used to it.

- I feel good about working with a computer on math and social studies lessons. It helps me to understand things.

- I always liked working with computers.

- I feel there should be more skills given in both math and social studies.

- Working with the computers is fun sometimes.

- Because it can improve your grades and you can learn some things that you did not know before.

- In math, working with the computer is fun because you learn new problems. In social studies, it's fun because you learn how to tell longitude and latitude and directions.

- The computer is really fun. It's just like a friend that even talks back, even though sometimes it may respond in words that make me laugh and sometimes mad.

- Working with the computer on math and social studies is a learning experience for me.

- The computer assisted instruction lab will improve your skills.

- Sometime when you work on the math lessons on the computer, it is boring and fun. I like social studies lessons the best; it is always fun and interesting.

- I think it is OK to go to the computer room if you have not been there in a while. In other words is fun.

- I like to work on computers. It's fun and all to help you with your math and social studies skills.

Comments from Students Attending the
Junior High School CAI Labs--Continued

- Sometimes the computer is helpful, but when you put in a question, it takes too long to answer.

- It helps me to improve my skills when working with the computer, and better understanding.

- In math the work is alright, but if we get finished, we should be presented with a game or something to play. In social studies I feel the same way about it, too, but a little more.

- I like to work on the computers anyway, but I like social studies more than math, but I think math is alright, but I still like social studies better than CAI.

- Sometimes the math and social studies are hard, but it is right on my grade level.

- I feel that the computer skill helps me out with my classroom skills, and I think that it is a good source of learning.

- I feel that working on a computer is fun and rewarding when it comes to social studies and math.

- I think that the math and social studies help me a lot.

- I feel that computer math is sometimes easy and sometimes hard.

- Doing math and social studies is kind of interesting.

- I think it is very interesting in math and social studies because it makes you learn more about math and social studies.

- I like working with the computers because they help you learn something you need to learn and tell you how to work the problem out. I like the computer room so when I'm older I will know what to do.

- Computer is fun. I like to go to the computer. When I need help, he comes and helps me. Computer is like you are typing a letter to somebody. I like the computer, that's all I know to say.

- It's very helpful in both subjects, math and social studies. It's more help in math than in social studies.

- I like working on computers in both subjects.

- I like working on the computers because it is fun. It helps my grade in math and social studies.

- I feel it's fun going to the computer room, working on math lessons.

Comments from Students Attending the
Junior High School CAI Labs--Continued

- I think that the computer on math and social studies lessons are very interesting.

- Math is OK but social studies is too hard. I don't like every time you miss one it goes back to six.

- I think we should get better computers.

- I like math. But working on the social studies is boring and if you get one wrong, you have to start over.

- I [illegible] working on the math computer, but social studies are boring.

- In math, we go to CAI Lab to work with computers. I really like working with computers. It helps me in math.

- I like working with the computer in math but not in social studies.

- I like it very well. Shows how well I use computers.

- It's fun, it's better than writing. Especially because I am going to major in computers.

- I feel like I'm in a new world, like I really know what I'm doing.

- I like to work with computers.

- It is fun and I am glad that we have computer classes.

- Sometimes it can be very boring and interesting. It takes a million years for the computer to respond to my answer.

- I feel like throwing up when I do social studies.

- I think it's a good idea, it's educational and fun.

- I think that the computers will help us in the long run, because of the new computers that are coming out.

- I feel that the computers are helping me a lot with the math and social studies skill lessons. It helps me learn more about the computers.

- I like working on the computers because it gives me more skills in the classroom.

- I think it is fun but I wish we could stay longer.

- The way that I feel about working with the computer on math and social studies lessons is that I like them and they help me understand my class lessons better.

Comments from Students Attending the
Junior High School CAI Labs--Continued

- I like working on math and social studies but math is the funniest.
- I feel that they both help me to do better work.
- I enjoy working with the computers. However, I would like to exceed my knowledge of computers by working on other subjects.
- I think it is very fun.
- I enjoy the computer on math and social studies lessons, because they help me with things that the teacher doesn't explain; to make me understand, when I'm old enough I plan to have a computer.
- I think the computer is nice and I like him.
- I love working on the math and social studies lessons.
- I like to do math on the computer. It helps me do my work better in class. I like social studies; it helps me a little in class.
- I love to go to the computer room. I think it is very interesting and also fun. Sometimes you get mad when you get an answer wrong, but the computer writes something to make you smile.
- I feel it is helping me to do better on the BEST Test.
- I like going to the computer room, it's fun.
- I enjoyed working because you have fun and are learning at the same time.
- I feel sometimes it helps you, other times it don't, and it's boring.
- Working with computers in social studies is okay. Working with computers in math is fun and I like to work with computers.
- I really like going to the computer room. It's very interesting.
- Working with computers is fun, and they help you to improve your work and class.
- I like to work on the computer in math better than social studies, but I like them both.
- I think working with the computer helps one learn more things and it is fun.
- It is nice because it gets children familiar with a computer and is a way to improve math and social study skills.
- I think the lessons can be harder.

Comments from Students Attending the
Junior High School CAI Labs--Continued

- I like to work on the computers because it helps me to learn.

- I like to work on the math and social studies because it can get us ready for the B.E.S.T. and the I.T.B.S. that is coming up and I just want to be ready and pass it.

- The computer helps to improve my skills. It helps me to get ready for the BEST test.

- I think our computer assisted instruction is very interesting.

Appendix B

COMMENTS BY TEACHERS WHO SENT STUDENTS TO THE JUNIOR HIGH SCHOOL CAI LABS

COMMENTS BY TEACHERS WHO SENT STUDENTS TO
THE JUNIOR HIGH SCHOOL CAI LABS

- I would like more contact with the computer instructor.

- The 7th graders ask all the time why they can't work on the computers.

- Students need more time. At least once a week.

- The manager of the CAI program is organized, fair with the students and runs the program very smoothly. The program is a good motivating tool with special education kids, and often the slowest in the regular class in the CAI room ends up showing the others how to do certain work. Great for the self-confidence.

- The organization of the computer material is a key to its success.

- Computer assisted instruction allows the student to work at his/her level. Some students are able to cover more material than would be possible in the classroom.

- I would like to be in the room along with my students to see at first hand what is being taught and just how they (students) respond. At the time of my students' CAI instruction, I'm in the classroom with another group.

- Very beneficial -- worthwhile -- interesting! Wish there were more terminals for the students!

- My students have improved in their reading skills. I have found the computer program to be very helpful.

- You can improve it by having more computers (one for each student) -- enabling each student to have more time for individual instruction on unmastered skills. Pupils should be able to be introduced to programming on the computer. Computer instructors should be well trained in the specified area that they are to be over.

APPENDIX C

- ANALYSIS OF COVARIANCE SUMMARIES
- ANALYSIS OF VARIANCE SUMMARIES

TABLE 5

Analysis of Covariance Summaries for Student ITBS Scores
(Eighth Grade Students Attending CAI Labs
Versus Eighth Grade Comparison Students)

ITBS Test Source of Variation	df	Mean Square	Value	Probability
Visual Materials				
Program	1	71.05	24.44	0.00 *
Covariate: 1983 scores on this test	1	3291.66	1132.19	0.00 *
Error	1647	2.91		
Mathematics Computation				
Program	1	8.34	7.76	0.01 *
Covariate: 1983 scores on this test	1	1763.79	1639.20	0.00 *
Error	1639	1.07		
Mathematics Concepts				
Program	1	11.25	8.44	0.00 *
Covariate: 1983 scores on this test	1	3650.93	2740.34	0.00 *
Error	1658	1.33		
Mathematics Problem Solving				
Program	1	13.84	8.04	0.01 *
Covariate: 1983 scores on this test	1	3433.03	1995.23	0.00 *
Error	1648	1.72		
Mathematics Composite Score				
Program	1	6.71	9.91	0.00 *
Covariate: 1983 composite scores	1	3151.17	4653.01	0.00 *
Error	1690	0.68		

* Significant at the .05 level

TABLE 6

Analysis of Variance Summaries for Student ITBS Gain Scores
(Eighth Grade Students Attending CAI Labs
Versus Eighth Grade Comparison Students)

ITBS Test Source of Variation	df	Mean Square	F Value	Probability
Visual Materials				
Program	1	39.04	12.01	0.00 *
Error	1648	3.25		
Mathematics Computation				
Program	1	4.84	4.23	0.04 *
Error	1640	1.15		
Mathematics Concepts				
Program	1	2.38	1.67	0.20
Error	1659	1.42		
Mathematics Problem Solving				
Program	1	7.69	4.31	0.04 *
Error	1649	1.78		
Mathematics Composite Score				
Program	1	5.04	7.39	0.01 *
Error	1691	0.68		

* Significant at the .05 level

EVALUATION OF CAI AT PASEO SENIOR HIGH SCHOOL

Program Description

CAI lessons were used in a variety of ways at Paseo Senior High School. Most ninth grade students attended the CAI lab, and tenth, eleventh and twelfth grade students who had not passed the Basic Essential Skills Test (BEST) also attended. Most students worked on CAI mathematics lessons, but some worked on social studies lessons or reading lessons. All ninth grade students in the School-Within-A-School (SWAS) Program attended the CAI lab and most of them worked on CAI lessons in all three subject areas. Paseo has a special computer program for keeping track of attendance at the school. The CAI terminals and the administrative terminals for attendance are running off the same computer line which is slowing the computer's response time to students using CAI lessons. The CAI lab aide left in the middle of the school year and was replaced by another CAI lab aide. There was a short time between lab aides when the CAI lab was not in operation.

Evaluation Procedures

This evaluation examined CAI's effect on selected achievement measures and perceptions about the CAI lab experience collected from students, teachers and the two CAI lab aides. Since few of the tenth, eleventh or twelfth grade students attended the CAI lab, only the ninth grade students were included in the evaluation of the CAI lessons at Paseo. All of the ninth grade students attending the CAI lab worked on CAI mathematics lessons; most of them worked on CAI social studies lessons; some students worked on CAI reading lessons. Since few students worked on CAI reading lessons, achievement in reading was not examined.

Ninth grade students took the Tests of Achievement and Proficiency (TAP) this past spring, so tests from this achievement battery were used to evaluate the achievement data. The Mathematics Test and the Using Sources of Information Test were chosen to evaluate the effect of the mathematics and social studies CAI lessons. Unlike the Iowa Tests of Basic Skills, the TAP does not have subtests. As a consequence, mathematics computation, mathematics concepts, and mathematics problem solving could not be examined separately. The Using Sources of Information Test measured students' skills in using charts, maps, graphs and dictionaries.

Since all of the ninth grade students enrolled in the SWAS Program attended the CAI lab, the comparison group needed to include SWAS students from another school with a SWAS Program. Besides Paseo Senior High School, Central, Northeast, Southwest and Westport Senior High Schools had SWAS Programs for ninth grade students. Central Senior, Northeast Senior, and Southwest Senior were eliminated as comparison schools because their ninth grade students had been involved with CAI lessons the previous year as eighth grade students at Central Junior, Northeast Junior, and Bingham Junior. Ninth grade students from Westport Senior were selected as comparison students because Westport provided the best control for any effects related to the SWAS Program.

The achievement data were analyzed by comparing the spring (posttest) scores of ninth grade students attending the CAI lab with comparison ninth grade students using analysis of covariance. Analysis of covariance is a procedure for analyzing data in which students' posttest scores are statistically adjusted to make two groups as similar as possible using pretest scores before the posttest scores are analyzed for differences between the two groups. For this evaluation, students' scores on the Quantitative Test from the Cognitive Abilities Test (CAT) were used to adjust the mathematics achievement scores, and

students' scores on the Verbal Test from the CAT were used to adjust the achievement scores on the Using Sources of Information Test. Since this is the first year that the TAP had been administered to Kansas City School District students, gain scores could not be evaluated.

Results

The evaluation results are presented in two sections. The first section contains results related to achievement, and the second section contains perception results from students, teachers and the CAI lab aides.

Effect on Achievement

Statistically significant differences between ninth grade students attending the CAI lab and comparison ninth grade students were determined by using a .05 significance level which gives a 95 percent probability that any differences between the two groups were real rather than chance differences.

The achievement data are presented in Table 7. The table contains two types of mean scores. The first mean score for each test is unadjusted and represents each group's grade equivalent mean score determined from their actual spring (posttest) scores on each test. The adjusted mean score for each test represents a scientific estimate as to how the two groups of students would have performed on the posttest assuming that they had identical pretest means. Analysis of covariance summaries using these adjusted scores can be found in Appendix F on page 50.

It can be seen from Table 7 that ninth grade students attending the CAI lab had significantly higher scores on the mathematics achievement measure than did the comparison ninth grade students. Differences between the two groups on the Using Sources of Information Test were due to random testing errors and were not attributed to effects of the program. Some students attending the

TABLE 7

Summary Data on TAP Grade Equivalent Scores for Ninth Grade Students Attending Paseo's CAI Lab and for Ninth Grade Comparison Students

TAP Test Type of Mean	Paseo CAI Students	Comparison	National Norm for Spring Testing
Using Sources of Information [1]			
Unadjusted Mean Score	8.20	8.44	9.74
Adjusted Mean Score [2]	8.28	8.33	
Mathematics			
Unadjusted Mean Score	8.02	7.92	9.94
Adjusted Mean Score [2]	8.12 *	7.79	

* 95% probability that differences between CAI students and comparison students were real rather than chance differences.

1 The TAP Sources of Information Test measures students' abilities to get and use information from charts, maps, graphs and dictionaries.

2 The adjusted posttest means represent a scientific estimate as to how the two groups of students would have performed on the posttest assuming that they had identical pretest means. The results from the Analysis of Covariance using these adjusted scores can be found in Appendix F.

CAI Lab had not worked on CAI social studies lessons but were included in this analysis. Inclusion of these students may have affected the results on the Using Sources of Information Test.

Perceptions of the CAI Lab Experience

Student Perceptions. A sample of students attending the Paseo CAI Lab were surveyed for their perceptions of the CAI lab experience. Their perceptions of the CAI Lab are presented in Table 8. At the bottom of the student questionnaire, students were invited to write one sentence describing their feelings about working with the computer on mathematics and social studies lessons. These comments may be found in Appendix D on page 44. The table shows that 77 percent of the surveyed students liked to work on the CAI mathematics lessons, and 61 percent of the students liked to work on the CAI social studies lessons. Also, 77 percent of the students indicated that the CAI mathematics lessons helped improve their mathematics skills, and 58 percent of the students indicated that the CAI social studies lessons helped improve their social studies skills. Fifty-eight percent of the students thought the CAI mathematics lessons were interesting, and 42 percent of them thought the CAI social studies lessons were interesting. Most students seemed to be comfortable with the difficulty of the CAI lessons, with only 5 percent of them indicating that the CAI mathematics and social studies were too hard, and slightly over a fourth thought these lessons were too easy. Seventy-seven percent of the students thought the computer took too long to respond when students had given it an answer.

Teacher Perceptions. Table 9 presents the perceptions about the CAI lessons collected from the eight teachers who sent their students to the CAI Lab. Comments which these teachers included on their questionnaires can be found in Appendix E on page 48. All but one of these eight teachers thought CAI was a helpful supplement to the teaching of their subject area, and these same seven teachers thought CAI should be continued in their subject area. The

TABLE 8

Student Perceptions of CAI Lab Experience
at Paseo Senior High School

Items	Agree	Undecided	Disagree
I like to work on CAI math lessons.	77%	11%	12%
I like to work on CAI social studies lessons.	61%	19%	19%
CAI math lessons help improve my math skills.	77%	12%	11%
CAI social studies lessons help improve my social studies skills.	58%	28%	14%
CAI math lessons are interesting.	58%	26%	16%
CAI social studies lessons are interesting.	42%	33%	25%
CAI math lessons are too easy.	27%	36%	38%
CAI social studies lessons are too easy.	28%	42%	30%
CAI math lessons are too hard.	5%	28%	67%
CAI social studies lessons are too hard.	5%	32%	63%
I think the computer takes too long to respond when I have given it an answer to a question.	77%	11%	12%

[1] The number of students responding to this questionnaire was 57.

TABLE 9

Teacher Perceptions of Computer Assisted Instruction Lessons at Paseo Senior High School [1]

Items	Agree N	Agree %	Undecided N	Undecided %	Disagree N	Disagree %
Computer assisted instruction is a helpful supplement to the teaching of my subject area.	7	88%	1	13%	-----	
I believe that computer assisted instruction lessons in my subject area help improve my students' skills in this subject area.	5	63%	3	38%	-----	
My students have enough scheduled computer assisted instruction time.	4	50%	1	13%	3	38%
The computer assisted instruction lessons need to be better coordinated with the work students are doing in my classroom.	4	50%	1	13%	3	38%
Computer assisted instruction should be continued in my subject area.	7	88%	1	13%	-----	
I would like my students to have more time to work in the computer assisted instruction lab on my subject area.	4	50%	1	13%	3	38%

[1] The number of teachers responding to this questionnaire was 8.

one remaining teacher was undecided about these two topics. Five of the eight teachers believed that CAI lessons in their subject area helped improve their students' skills in the subject area. Half of these teachers indicated that their students had enough scheduled CAI time and half of them indicated that they would like their students to have more time in the CAI lab. Half of the teachers indicated that the CAI lessons needed to be better coordinated with the work students were doing in their classroom.

CAI Lab Aide Perceptions. The evaluator visited the Paseo CAI Lab several times to collect information about CAI usage at this site. As already indicated, one CAI lab aide left in the middle of the year and was replaced by another aide. Both of these aides were interviewed, although the second aide was very new to the program and understandably had not formed many opinions about the program when interviewed.

The two CAI lab aides were positive about the program, although both of them saw computer response time as a major problem. Low achieving students have a low attention span and they quickly became impatient when the computer terminal was slow in reacting to their responses. Students either got bored or began banging on the terminal keys in frustration. Response time was the lab aides' biggest problem because it affected student control in the lab and students' concentration. One aide indicated that individual carrels would be helpful so students could concentrate on their own work better.

One of the aides thought the integration of reading and spelling with the mathematics and social studies lessons was good for students and helped them see the necessity of knowing how to read and spell in order to do other things. Additionally, this aide indicated that it would be helpful to better integrate the work in the CAI labs with the work students were doing in their classrooms. This aide also stated that he had some difficulty getting sufficient supplies for the CAI lab, e.g., maps needed for the CAI social studies lessons.

APPENDIX D

COMMENTS FROM STUDENTS ATTENDING THE PASEO CAI LAB

COMMENTS FROM STUDENTS ATTENDING THE PASEO CAI LAB

Each student was invited to write one sentence that described how he/she felt about working on math and social studies lessons in the CAI Lab. The following comments are the sentences they wrote.

- I like the computer because it's fun to work with and it explains the problem real well.
- I feel that it is alright but when you stay in here all day you get bored.
- I feel that the social studies and math lessons have really helped me a lot.
- Working with computers is fun, it helps to improve my knowledge.
- I think that the CAI Lab is a great experience for those who need extra help in their math and social studies work.
- I like working with the computer in social studies. I think it is a lot of fun and it helps me to learn a lot. I really do like working with computers.
- I like it because it's interesting.
- I like working with the computers on my social studies because I'm improving on it.
- In math or CAI, I feel that it is a great experience for me. I really like math and computers and it gives me the opportunity to work on my skills in understanding computers and doing my math work okay.
- Computers are fun, they could improve your skills in social studies and math.
- The computer instruction is very helpful in my daily work.
- The way I feel about the lab is that it's fun in here because you find out more about computer and I like it here in the lab.
- I feel that working with the computers is a good experience so that we can learn how to do the problems that we may not know how to do.
- I enjoy working with the computer. I think I would like to learn more.
- The math computer helped me improve my skills.
- I feel that computer on math is helping me learn more about math and getting a better understanding.
- I don't feel nothing, it's just boring to me, but it helps me with my math skills and social studies skills. It's a little fun and some of it is hard.

Comments from Students Attending
the Paseo CAI Lab--Continued

- I think the math is too easy for 9th graders but I enjoy working on the math and social studies computer.

- I like working in the computer, it's fun in math.

- I feel that I can learn more by working on the computer and it helps me a lot.

- I really like working with the computers. To me it's a lot better than working in books because the computer tells you what you did wrong.

The following comments came from a sample of students from the SWAS Program at Paseo Senior High School:

- I don't feel nothing. It's just a great thing to do in place of schoolwork.

- I feel good working with the computer because it helps me learn more, and it's very interesting.

- I like working with the computer because it helps me a lot on my math and social studies.

- I like the computers because they don't yell when I get a problem wrong.

- I do like to work in the computer room but not so often. My favorite is reading, that's all I have to say.

- I really like working on the computer with math because it really helps me, but social studies is very boring and does not help.

- I don't like the computer room. I hate the computers. The only two things I do like is the teacher, he's nice, and I get to sit by girls.

- I don't like nothing about the math or the computers.

- At first it used to be fun but now it is boring, it could be better.

- I do not like to work on computers, they are not my thing.

- There are a lot of math problems that are very easy, so are social studies. The teacher gives us attitudes that we don't like. He may talk about your clothes, he may talk about your watch. He is not the teacher we want.

- The computer is OK, but it is sometime the teacher....doesn't have two teachers in the class and the computer takes too long to change. And the lessons is too easy.

Comments from SWAS Students--Continued

- Math is my favorite subject and I thought that math should not be too hard on us. Social studies, I don't like it.
- It tells you more about what you are working with.
- It's fun and also very interesting.
- It is nice, it helps you learn more about work.
- I feel it is good that we could come to the CAI because it is helpful to others.
- This is a good program. I just wish that I had more time for it, then it would be more helpful I really do think.
- I feel that the computer room helps improve my grades.
- The computers take too long to do what I have to do.
- It's OK, and sometimes I like working with it.
- It is OK but I would like something like businesses.
- It's fun.
- I think the computer lab is a very interesting lab and the teachers.
- In the computer class, the math is really not difficult because my math teacher helps more.
- I like working with the computer. They teach me a lot of things I don't know and they correct the things I get wrong.
- I think that it is going good with math and social studies.
- I enjoy working with the computer in math because it helps me develop my skills in math and it's interesting.

APPENDIX E

COMMENTS BY TEACHERS WHO SENT STUDENTS TO THE PASEO CAI LAB

COMMENTS BY TEACHERS WHO SENT STUDENTS TO THE PASEO CAI LAB

- I am very pleased with the lab aide. I appreciate all his help. Hopefully, my students will be able to continue with computer assisted instruction because we are living in a "computer age". The computer assisted instruction is one of the many excellent programs at Paseo High School.

- In social studies, some materials which would aid students on the Government/ Economics section of the BEST would be very useful.

APPENDIX F

ANALYSIS OF COVARIANCE SUMMARIES

TABLE 10

Analysis of Covariance Summaries for Student TAP Scores
(Ninth Grade Students Attending Paseo CAI Lab
Versus Ninth Grade Comparison Students)

TAP Test Source of Variation	df	Mean Square	F Value	Probability
Sources of Information				
Program	1	0.16	0.03	0.86
Covariate: CAT Verbal score	1	878.65	165.81	0.00 *
Error	320	5.30		
Mathematics				
Program	1	9.47	5.01	0.03 *
Covariate: CAT Quantitative score	1	693.95	367.43	0.00 *
Error	340	1.89		

* Significant at the .05 level

EVALUATION OF CAI IN ELEMENTARY SCHOOLS

Program Description

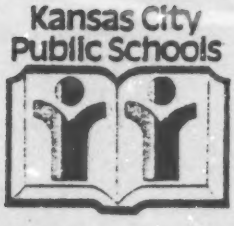
Four elementary schools were using the school district's CAI lessons this past year. Bryant School has used CAI reading lessons for two years as a supplementary resource for the Computer Managed Instruction (ANSWER) Program. Students who have not been identified by the ANSWER Program as needing assistance with reading may use advanced CAI reading lessons or CAI mathematics lessons. Ladd School's CAI lab began in March of 1982 and was in it the first full year of implementation. All students in grades three through six used the CAI lab. Most students were working on CAI reading lessons corresponding to their reading level in the Houghton-Mifflin reading series. Students who finished the CAI lessons for their Houghton-Mifflin reading level worked on either CAI mathematics lessons or CAI social studies lessons. Both Troost School and Woodland School were in the process of setting up CAI labs this past year.

Evaluation Concerns and Results

An examination of the CAI labs at the elementary schools revealed some problems that made the evaluation of this program inappropriate at this time. Neither Troost nor Woodland Schools had their labs operational until late in the school year, so they were eliminated from the evaluation immediately. Bryant School's CAI lessons were closely linked to the ANSWER Program, and Ladd School was in its third year of implementing the Chicago Mastery Learning Reading Program. In order to evaluate the CAI Program, it would be necessary to isolate the effects of these other programs. In addition, Bryant School used CAI lessons with gifted/talented students. An attempt was made to match Ladd School with a school that was also implementing the Chicago Mastery Learning

Reading Program, and an attempt was made to match Bryant School with another school using the ANSWER Program and having gifted/talented students. Satisfactory matches could not be found for these two schools, and an examination of the achievement results from these unsatisfactory matches revealed conflicting and uninterpretable results. It was concluded that CAI lessons in the elementary schools could not be objectively evaluated this year.

It should be pointed out that student and teacher perceptions of CAI lessons at Bryant School were examined as part of the evaluation of the CMI (ANSWER) Program last year. Both the teachers and the students at Bryant School were extremely positive about the CAI reading lessons used in conjunction with the ANSWER Program.



School District of Kansas City, Missouri